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JUNE 1973, No. 6

FISHING INFORMATION

UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



NATIONAL
MARINE
FISHERIES
SERVICE

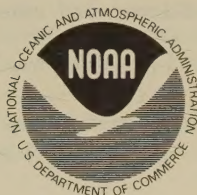
OUTHWEST
FISHERIES
CENTER
LA JOLLA,
CALIFORNIA

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE

SOUTHWEST FISHERIES CENTER
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FISHING INFORMATION

JUNE 1973, No. 6



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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

R. Michael Laurs, Leader
Fishery-Oceanography Investigations
La Jolla, California

CONTENTS

	PAGE
Acknowledgements	iv
Sea Surface Temperature and Environmental Conditions - June 1973, L. Eber and F. Miller	1
Subsurface Temperature Structure in the Northeast Pacific Ocean, J. F. T. Saur.	2
Airborne Infrared Sea Surface Temperature Survey off San Diego.	3
<u>ENVIRONMENTAL CHARTS, PACIFIC OCEAN - JUNE 1973</u>	
Figure 1. Thirteen-year mean (1961-73) observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction.	4
Figure 2. Observed sea level values of barometric pressure (millibars), resultant wind direction (degrees true), resultant wind speed (knots) and average wind speed (knots) regardless of direction	5
Figure 3. Mean sea surface temperature, eastern North Pacific Ocean. Squares show temperatures at weathership stations. Numerals on shore are temperatures at coastal and lightship stations	6
Figure 4. Mean sea surface temperature chart, western North Pacific Ocean.	7
Figure 5. Deviation of sea surface temperatures, eastern North Pacific Ocean from long-term charts of H. O. 225. Hatched areas are colder in 1973.	8
Figure 6. Deviation of sea surface temperatures, eastern North Pacific Ocean from those of June 1972. Hatched areas are colder in 1973	9
Figure 7. Mean sea surface temperatures, eastern tropical Pacific Ocean. Numerals on shore are temperatures at coastal stations	10
Figure 8. Deviation of sea surface temperatures, eastern tropical Pacific Ocean from long-term charts of H. O. 225 and NAVOCEANO sp-123. Shaded areas are colder in 1973. Contours are dashed in sparse data areas	11
Figure 9. Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between San Francisco and Honolulu: June 2-5, 1973.	12
Figure 10. Surface temperature and salinity and subsurface temperature structure from expendable bathythermograph observations between San Francisco and Honolulu: June 16-19, 1973	13
Figure 11. Airborne Infrared Sea Surface Temperature Survey off San Diego on June 11, 15, 20 and 28.	14

ENVIRONMENTAL CHARTS ANALYZED BY:

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 J. Renner (Figures 1, 2, 3, 5, and 6), J. F. T. Saur (Figures 9 and 10)
 J. L. Squire (Figure 11)

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Expendable bathythermograph observations are made by the mates of the S. S. Hawaiian Enterprise of Matson

Navigation Co., and processed with assistance from the NMFS Environmental Group, Monterey:

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Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

Seasonal warming in June 1973 was most pronounced in the region between latitudes 30° and 35° N, west of 145° W, where sea surface temperatures increased as much as 5° F (2.8° C) above corresponding values in the previous month. Deviations from the long-term mean exceeded 2° F (1.1° C) in most of this region and reached 4° F (2.2° C) west of 175° W (Figure 5). Surface warming occurred at a slower rate than normal in and south of the Gulf of Alaska causing colder than normal temperatures to increase in magnitude and spread southward. Consequently, June temperatures were below normal nearly everywhere north of 35° N. South of 35° N, temperatures were a little higher than normal off southern California and northern Baja California, otherwise, surface waters were cooler than normal from the coast out to about 135° W and in the zone 20° to 25° N, as far west as Hawaii.

Mean atmospheric pressures in June 1973 were a few millibars below normal in the Gulf of Alaska east of 155° W and southward to about 43° N (Figures 1 and 2). Cyclonic activity in the vicinity of 50° N, 140° W reached peak intensities on or about the 4th, 11th and 22nd days of the month. Strong surface winds during these periods may have contributed to the anomalously low surface temperatures by causing warm surface layers, typically shallow in high latitudes at this time of year, to be mixed with colder subsurface water. The countering effect of advective warming due to anomalous southerly surface winds east of 140° W was negligible in this case because the isotherms swing northward north of 45° N and were nearly parallel to the mean wind direction.

Surface pressures in areas south of 40° N did not differ significantly from normal although the mean resultant winds indicate stronger-than-normal southerly components west of 135° W, between latitudes 30° and 35° N, where maximum warming occurred.

Eastern Tropical Pacific

The cooling and warming trends established during May in the sea surface temperatures of the eastern tropical Pacific have continued in June (Figure 7). In the southern hemisphere the Peru Current and its equatorial extension cooled at a faster rate than is usual for early southern winter. The pattern of negative anomalies (Figure 8) from the coast of South America to the equatorial Line Islands is similar to that of last month, and reflects a return of extensive upwelling in the Peru Current and along the equator. This condition was associated with strong southeast trade winds and above-normal cloudiness.

Because sea surface temperatures were not available in June for coastal stations from Ecuador to Chile, the isotherms (Figure 7) and temperature anomalies (Figure 8) east of 90° W are based on only scattered ship reports.

The maximum warming took place north of the equator, east of 140° W. Sea surface temperatures usually warm up between the equator and 15° N in June, and warming near the equator, adjacent to upwelling to the south, causes an intensification of the equatorial ocean front. This frontal boundary usually has the strongest latitudinal gradient east of the Galapagos Islands, and as the northern summer progresses the equatorial front becomes more intense west of 90° W.

The general cooling between 10° N and 25° N, east of 150° W (Figure 8) was associated with above-normal cloud cover and northeast trade winds which averaged 2 to 8 knots above the long-term mean. The relatively cool surface temperatures between 90° W and 120° W were associated in part, with the very intense hurricane, AVA, and two tropical storms, all of which originated near 10° N, 95° W and moved northwest through the fishing grounds.

Subsurface Temperature Structure in the Northeast Pacific Ocean

J. F. T. SAUR

Two sections of expendable bathythermograph observations were made by the SS Hawaiian Enterprise in the first and third weeks of June, Figures 9 and 10 respectively. Some data are lacking near Hawaii due to instrumentation problems.

Except for higher temperatures in the surface layer the general character of the vertical temperature structure and the position of oceanic fronts or boundaries changed little from mid-May to June. Surface temperatures rose by about 1°C (1.8°F) in a 4-week period, while the average temperature of the upper 100 meters rose only about 0.5°C (0.9°F). This reflects the fact that the nearly mixed surface layer depths averaged about 40 meters so that the temperature changes were limited mostly to the upper 40 meters of the water column.

The transition zone between the waters of the California Current (CC) and the eastern North Pacific (ENP) Central water remained in nearly the same location as in April and May. The surface salinity boundary marking the outer edge of the CC waters moved about 100 n. miles eastward to near 131°W in the first part of June and became less distinct, but the subsurface temperature boundary (identified by the deepening of the 15°C isotherm) remained near 133°W .

A marked westward increase in the surface salinity persisted at 141°W (between stations 10 and 11 in Figure 10) indicating the surface front between the transition zone and ENP waters. The subsurface temperature boundary (identified by the deepening of the 10° isotherm to below 300 m) occurred somewhat farther west, between 142° and 143°W .

The waters with temperatures between 16°C (60.8°F) and 19°C (66.2°F) are of interest because the best albacore fishing is often associated with shallow surface layers in this range. In Figures 9 and 10 the shading designates the location of the 16° - 19°C temperature range. In May the 19°C isotherm at the surface and in the mixed layer was close to the surface salinity front between the transition zone and ENP waters. In early June the 19°C isotherm had shifted eastward in a very thin surface layer (less than 5 m) away from the salinity front, but a 19°C layer remained at the front between 5 and 30 meters. By June 16-19 a surface layer warmer than 19°C and about 35 meters in depth had formed eastward of the salinity front, near the center of the transition zone.

The surface 16°C isotherm in May was in the middle of the transition zone. By early June it was in the CC region at the surface about 425 n. miles from the coast. For 600 n. miles westward along the section the 16°C isotherm was near the bottom of the mixed layer at about 40 m depth. In the next 2 weeks, until June 16-19, the surface location of the 16°C isotherm moved only about 60 miles further toward the coast in the CC region. Between 550 and 800 miles from the coast, however, it was below the surface thermocline and varied in depth from 60-100 meters in a layer which was nearly isothermal (see vertical profile for Station 6 in Figure 9).

If typical upwelling conditions and summer heating occur during July we would expect the band of surface temperatures between 16° and 19°C to lie between 200 and 600 miles along the section west of San Francisco, mainly within the CC region.

Airborne Infrared Sea Surface Temperature Survey Off San Diego

J. L. SQUIRE

Sea surface temperature surveys are being conducted each week, April through October for the important fishing areas off San Diego. These surveys are part of a cooperative program between the NMFS La Jolla Laboratory and the California Department of Fish and Game to evaluate the effects of temperature changes on the distribution of important game fish species such as yellowtail, bonito, barracuda, white sea bass and other species entering the sport catch.

The first series of monthly charts appeared in the April issue of Fishing Information.

During June 1973 four survey flights were conducted and the approximate temperatures at the major fishing locations in °F are shown below (for conversion to °C consult the charts). 1972 temperature data for the corresponding periods are shown in parenthesis (64° etc.). The difference between the 1972 measurement and that observed in 1973 is given below the 1973 temperature.

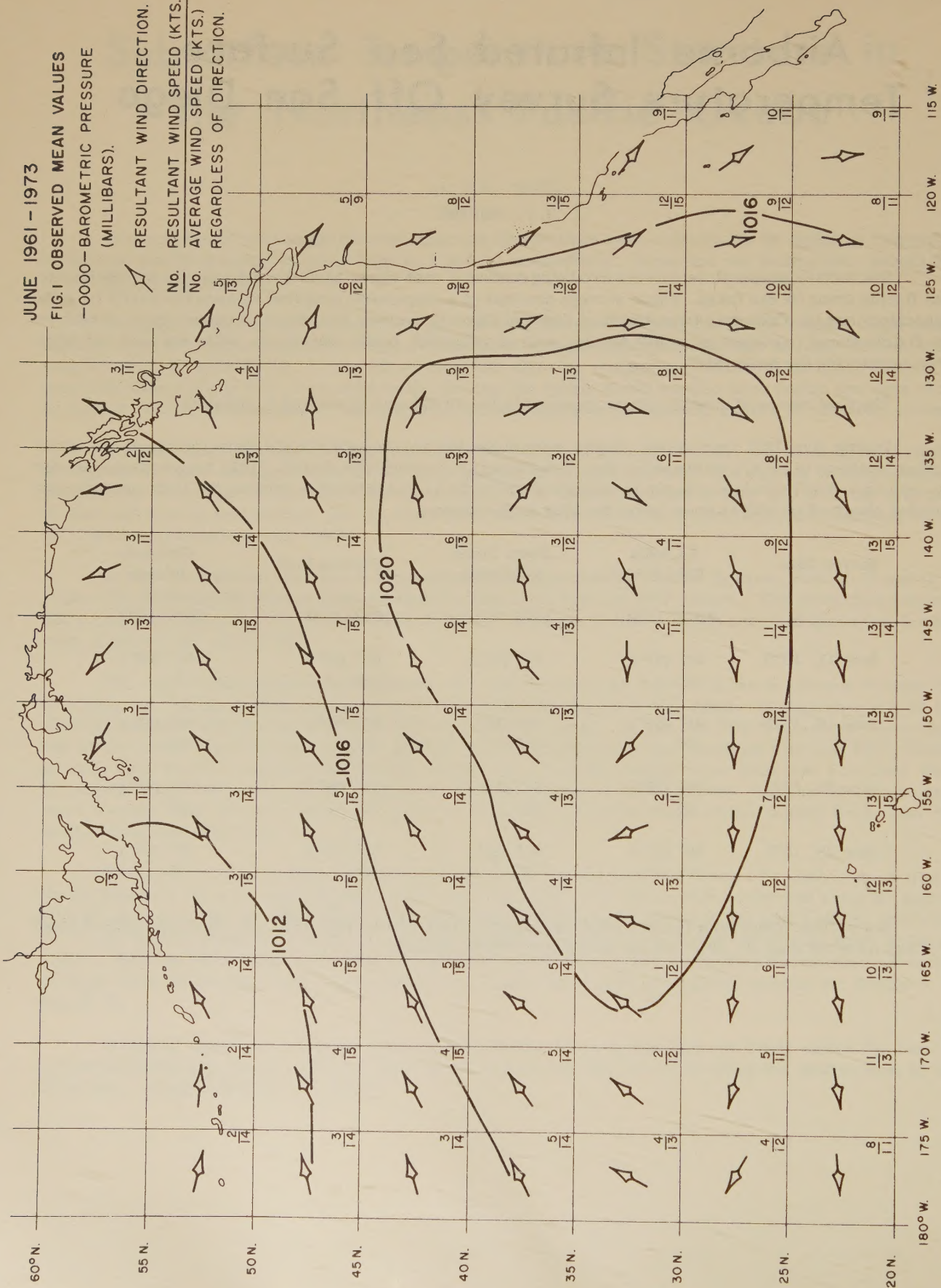
Survey Date	La Jolla Kelp Area		Point Loma Kelp Area		Tijuana Kelp		Coronado Islands	
	1973	1972	1973	1972	1973	1972	1973	1972
June 11, 1973	64°	(67°)	62°	(67°)	62°	(64°)	62°	(66°)
	-3°		-5°		-2°		-4°	
June 15, 1973	64°	(69°)	64°	(68°)	63°	(65°)	63°	(66°)
	-5°		-4°		-2°		-3°	
June 20, 1973	69°	(69°)	68°	(68°)	68°	(67°)	67°	(66°)
	0°		0°		+1°		+1°	
June 28, 1973	66°	(67°)	64°	(66°)	61°	(64°)	63°	(66°)
	-1°		-2°		-3°		-3°	

Sea surface temperatures were stable through the first half of June 1973. A rapid increase of about 4° F was noted on June 20, 1973, which cooled by 2-3° F by June 28.

JUNE 1961 - 1973

FIG.1 OBSERVED MEAN VALUES
-0000-BAROMETRIC PRESSURE
(MILLIBARS).

RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.)
REGARDLESS OF DIRECTION.



JUNE 1973

FIG. 2 OBSERVED VALUES

-0000—BAROMETRIC PRESSURE

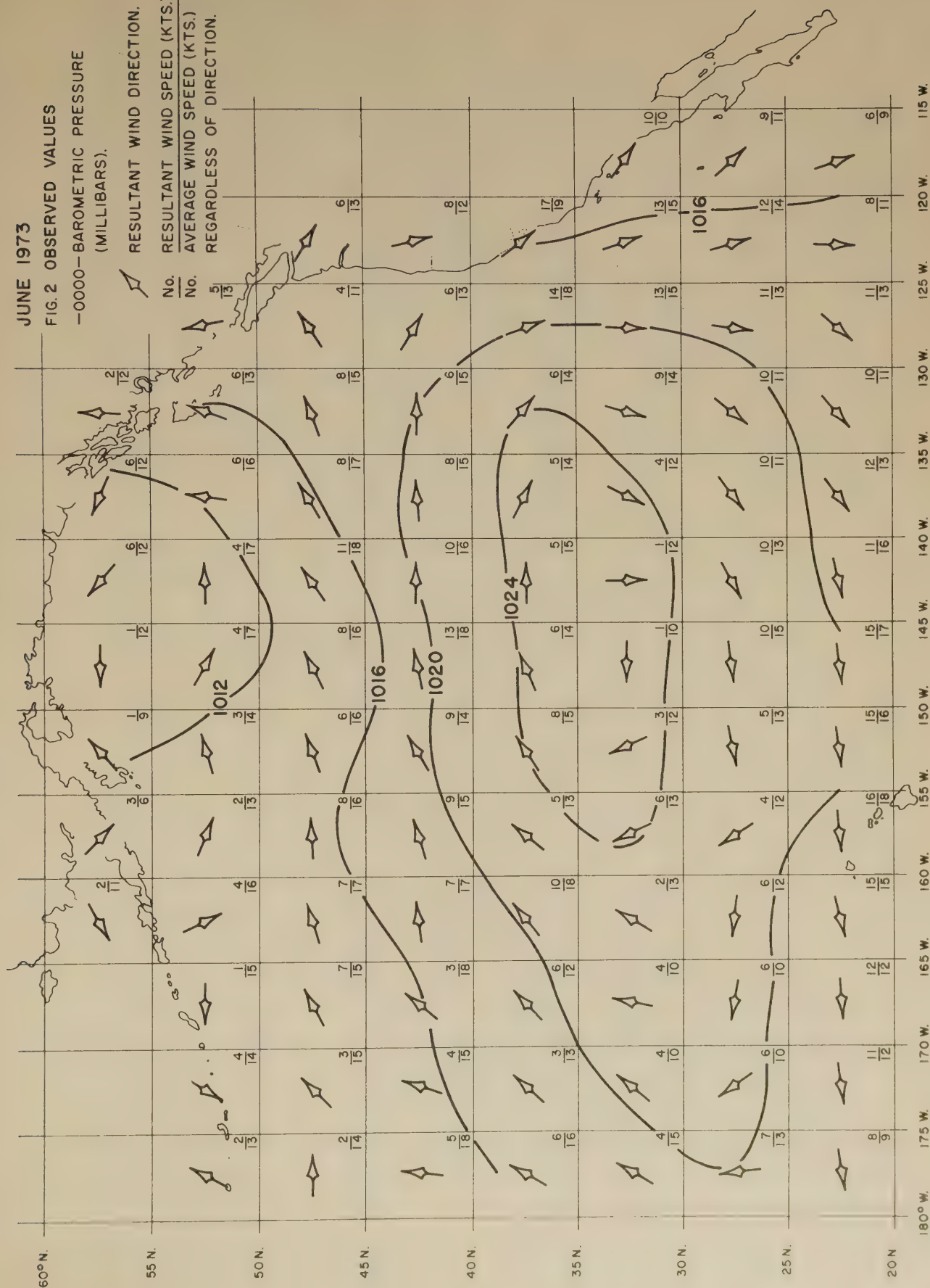
(MILLIBARS).

RESULTANT WIND DIRECTION.

No. RESULTANT WIND SPEED (KTS.).

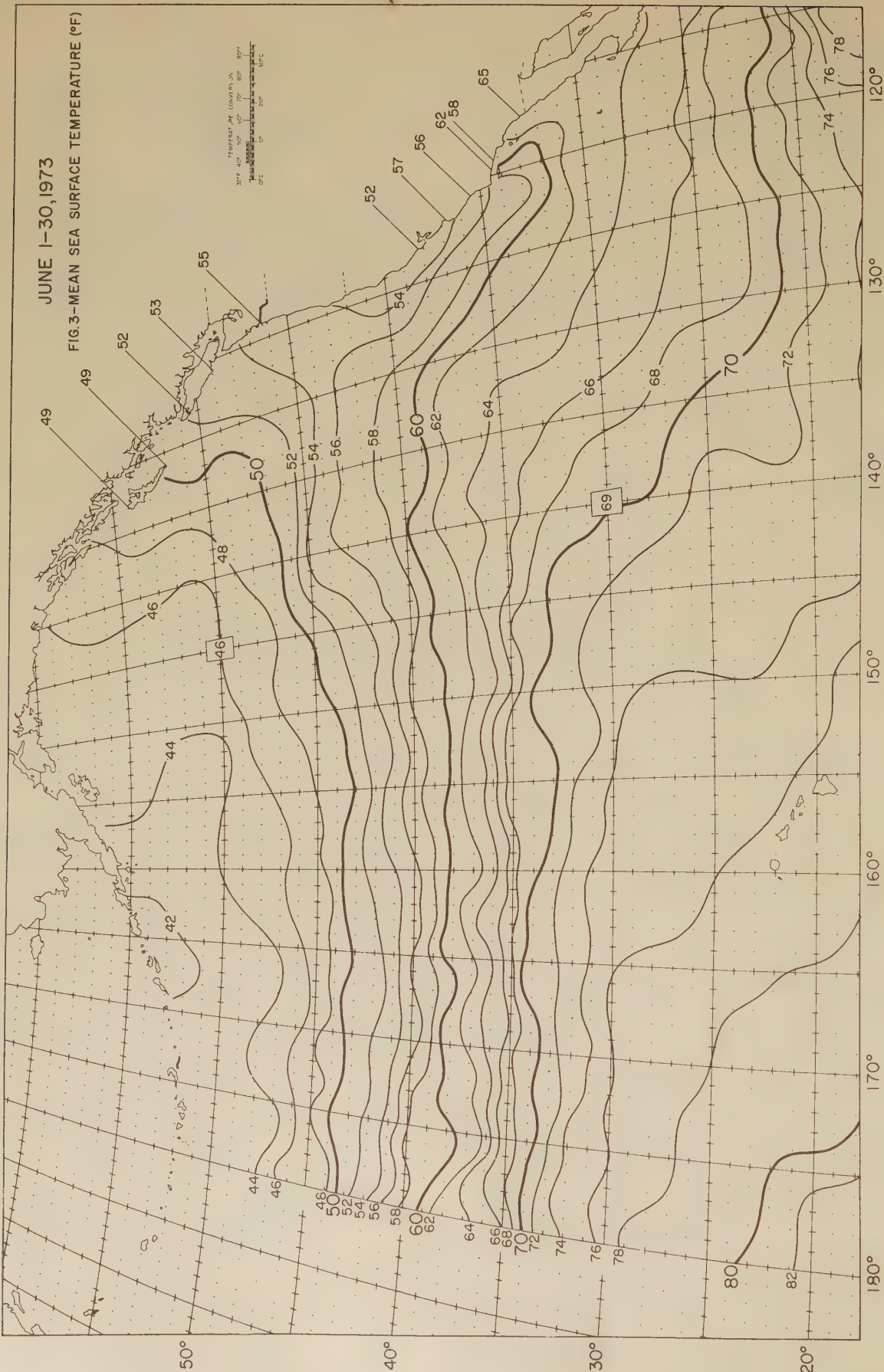
No. AVERAGE WIND SPEED (KTS.)

REGARDLESS OF DIRECTION.



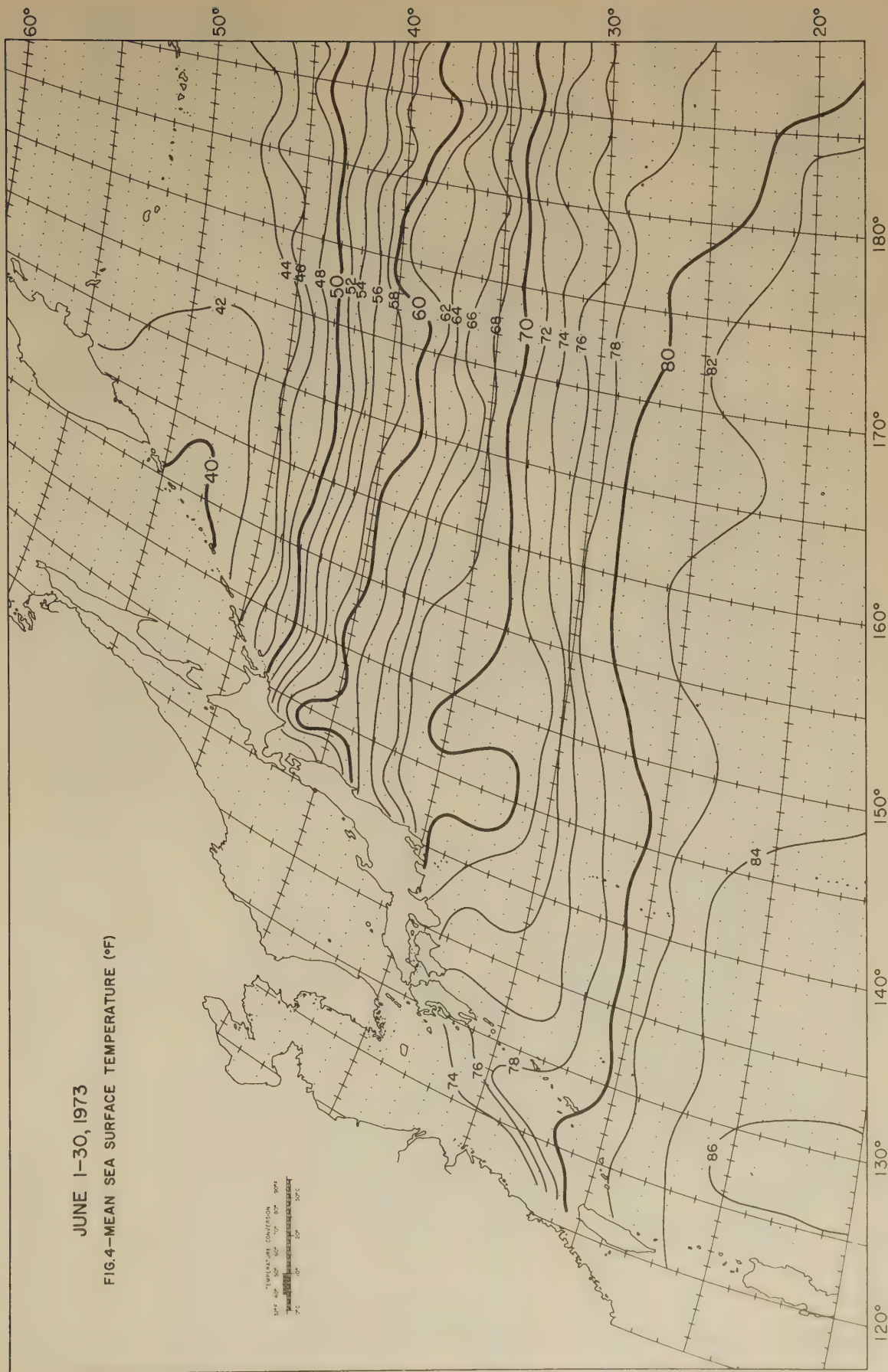
JUNE 1-30, 1973

FIG. 3-MEAN SEA SURFACE TEMPERATURE (°F)



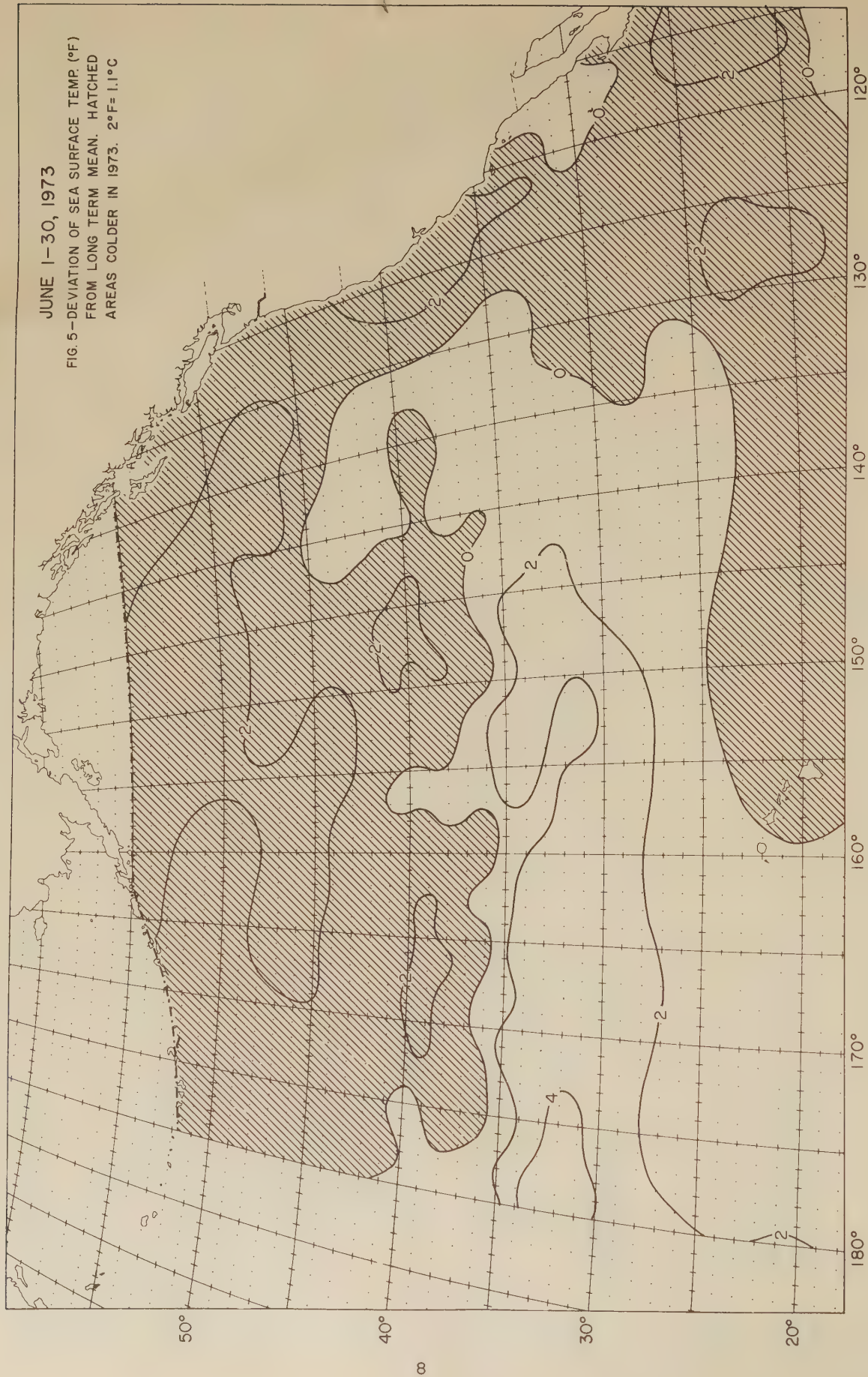
JUNE 1-30, 1973

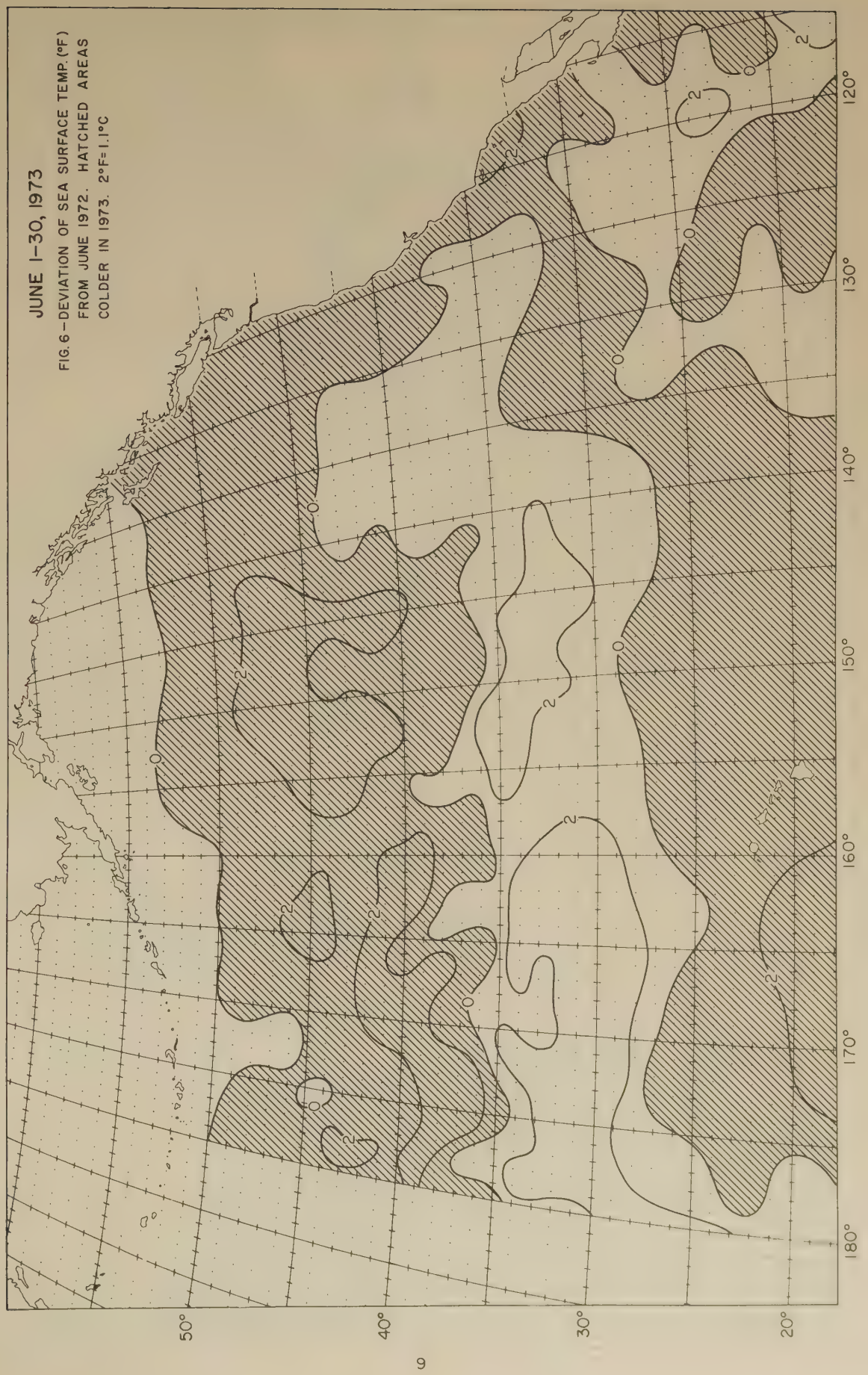
FIG. 4—MEAN SEA SURFACE TEMPERATURE (°F)



JUNE 1-30, 1973

FIG. 5-DEVIATION OF SEA SURFACE TEMP. ($^{\circ}\text{F}$)
FROM LONG TERM MEAN. HATCHED
AREAS COLDER IN 1973. $2^{\circ}\text{F} \approx 1.1^{\circ}\text{C}$





JUNE 1-30, 1973

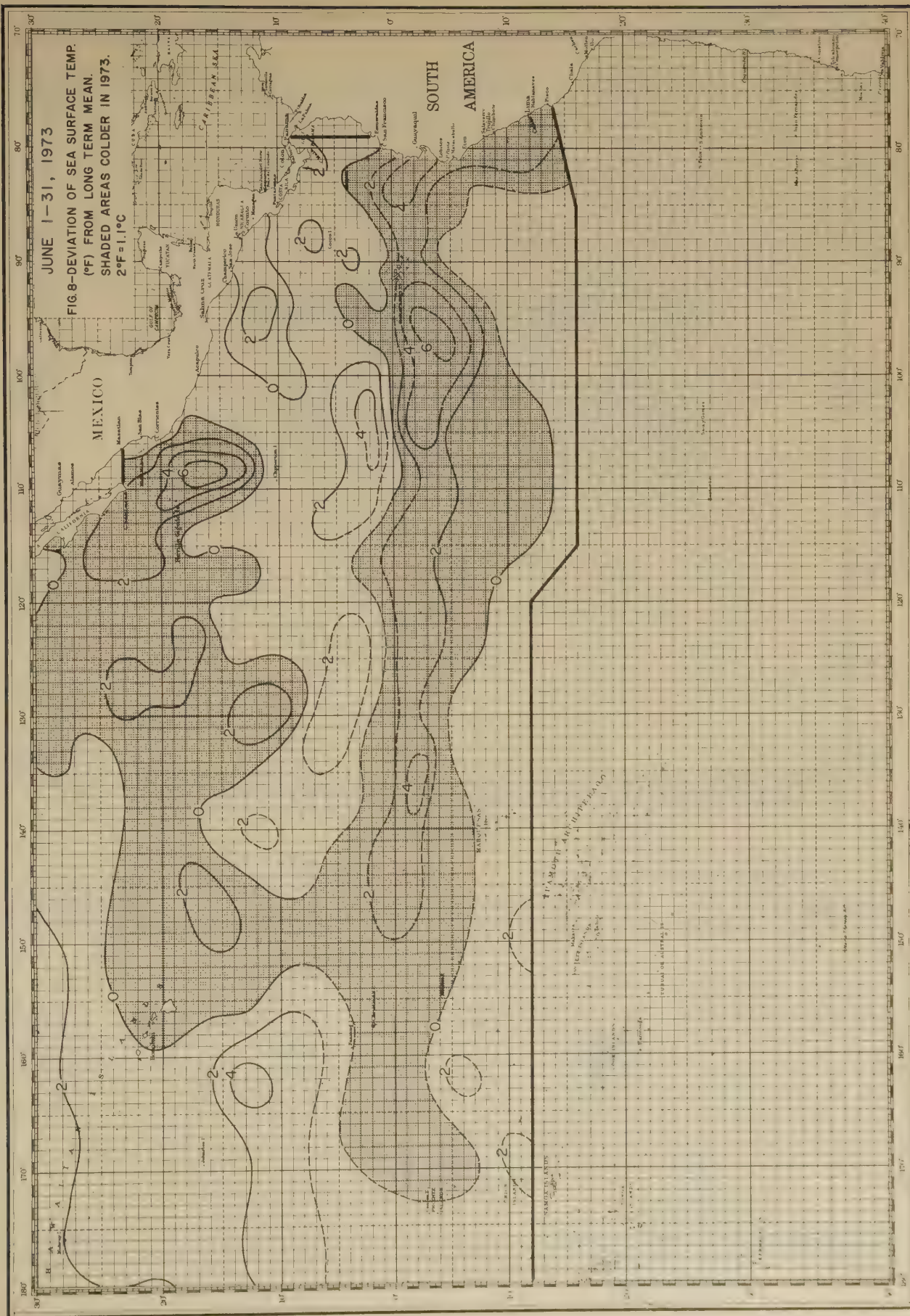
FIG. 6—DEVIATION OF SEA SURFACE TEMP. (°F)
FROM JUNE 1972. HATCHED AREAS
COLDER IN 1973. 2°F=1.1°C

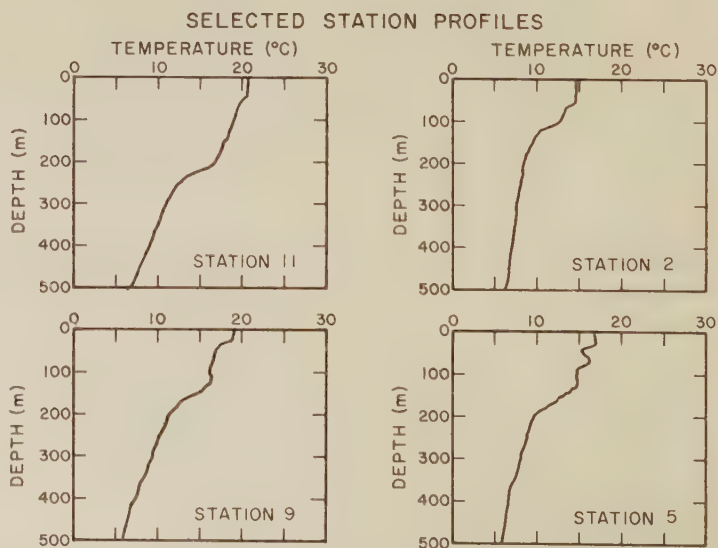
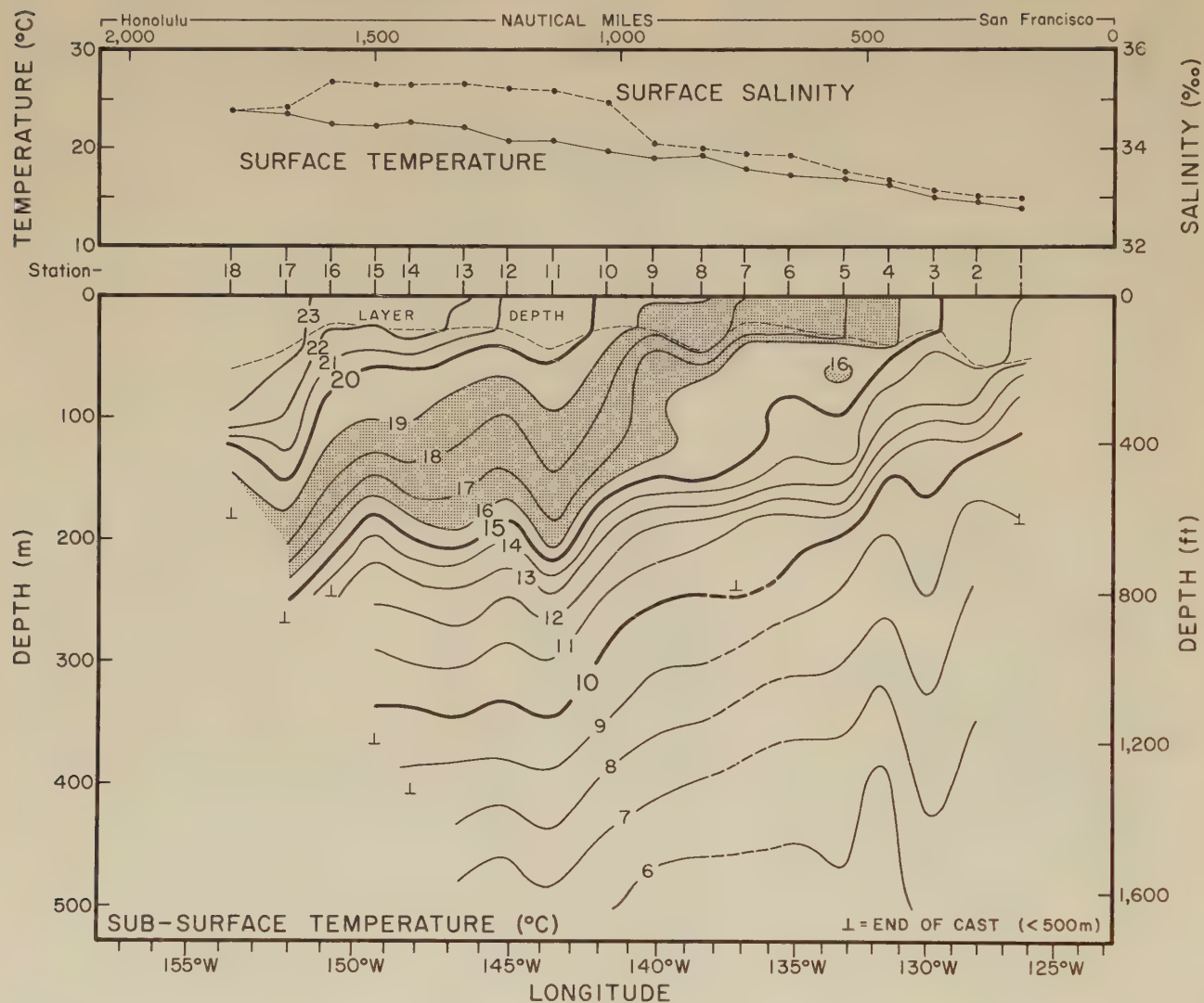
MEAN SEA SURFACE TEMPERATURE
(°F). DASHED LINES INDICATE
SPARSE DATA. 30°F 40° 50° 60° 70° 80°



JUNE 1-31, 1973

FIG. 8-DEVIATION OF SEA SURFACE TEMP.
(°F) FROM LONG TERM MEAN.
SHADED AREAS COLDER IN 1973.
2°F = 1.1°C





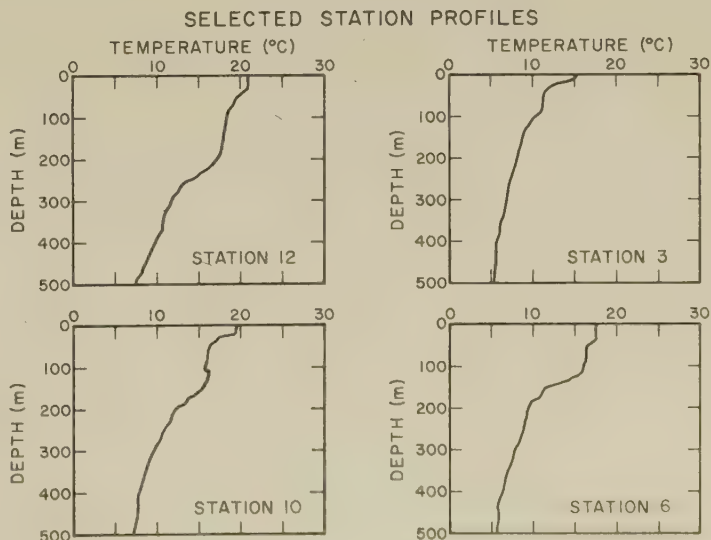
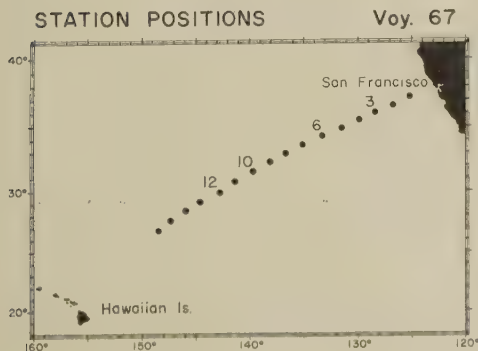
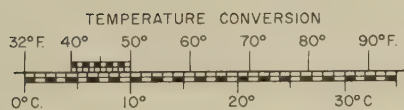
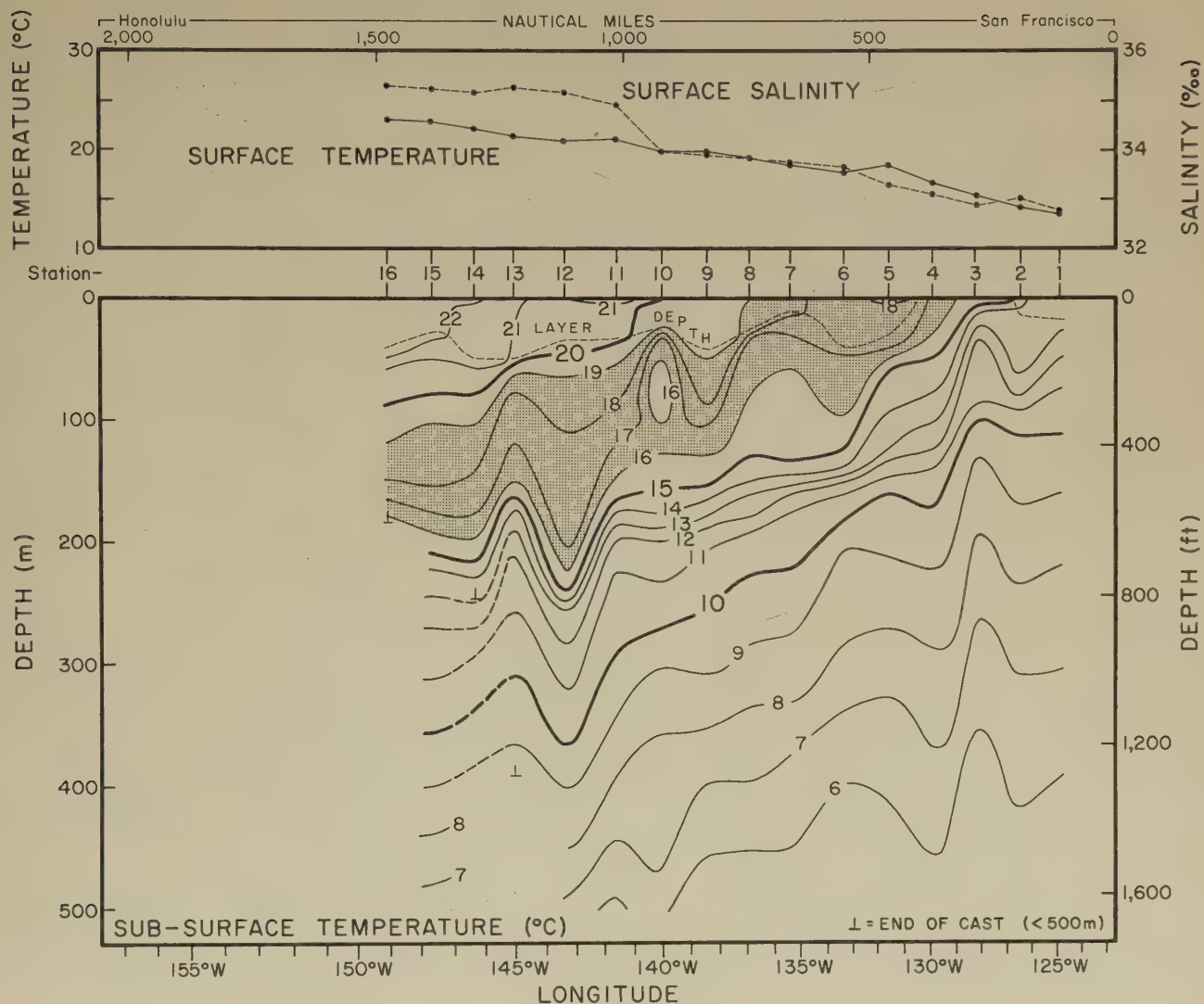
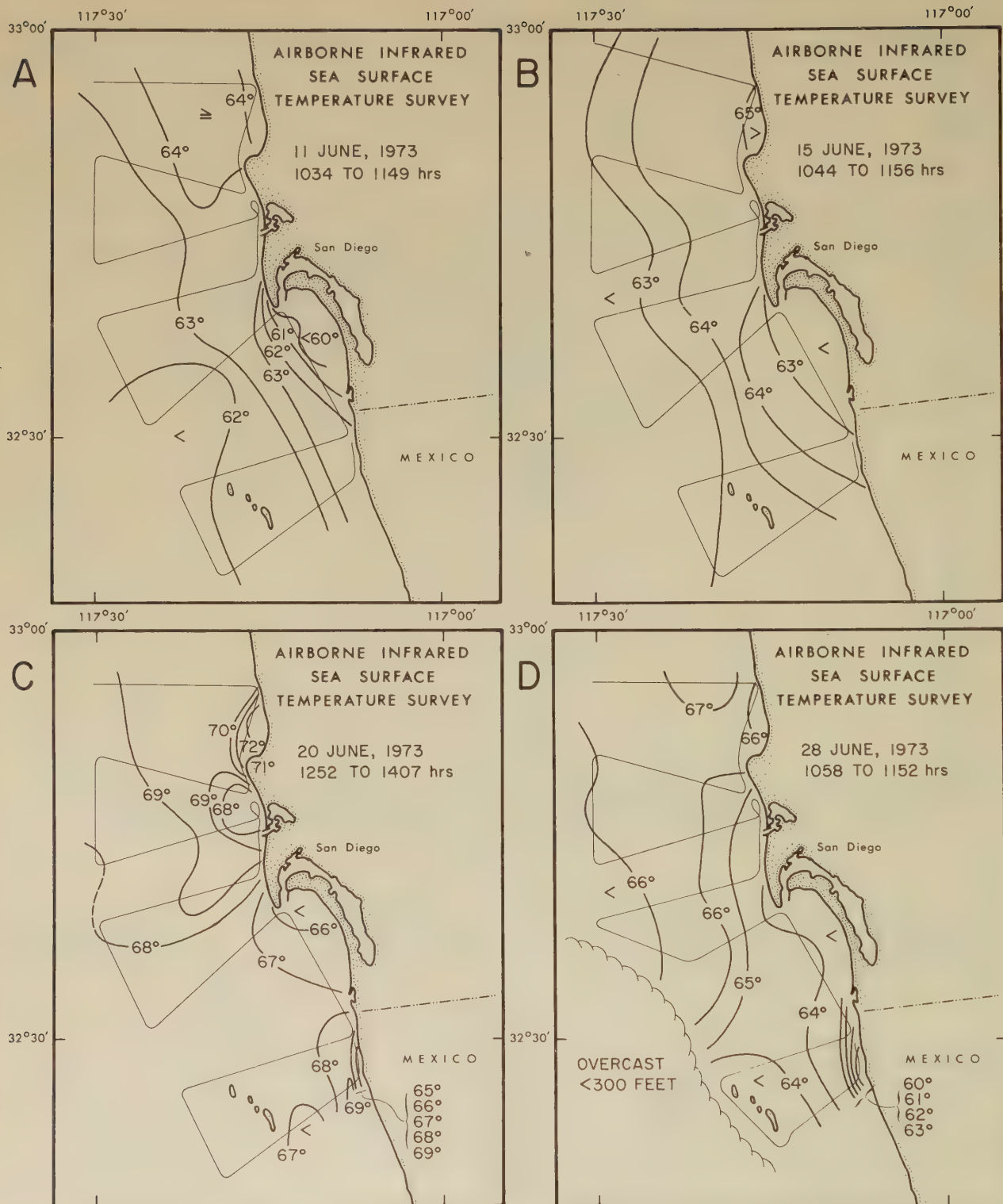


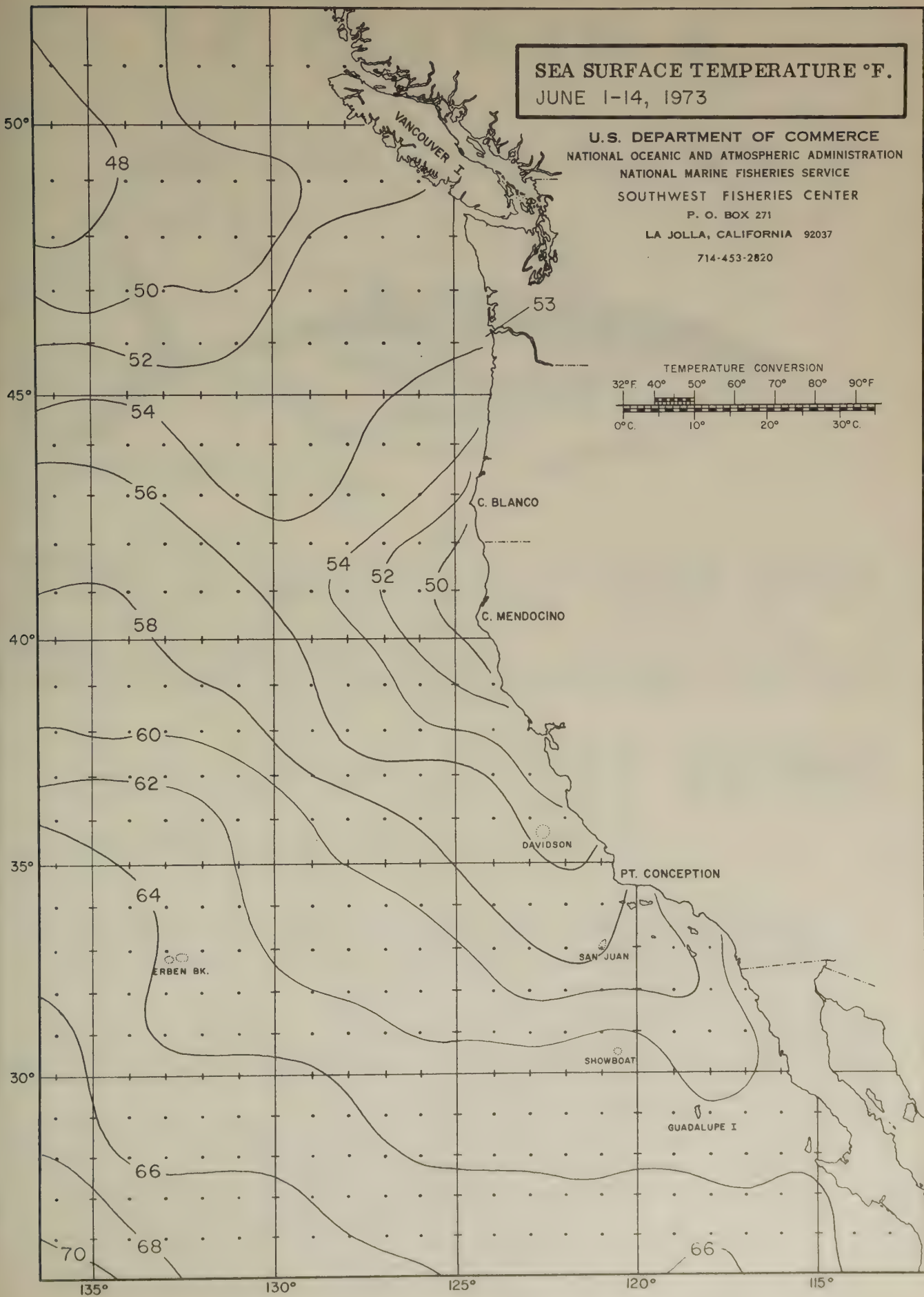
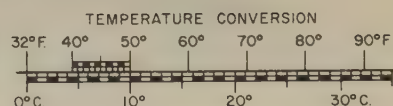
FIGURE 11— JUNE 1973



SEA SURFACE TEMPERATURE °F.

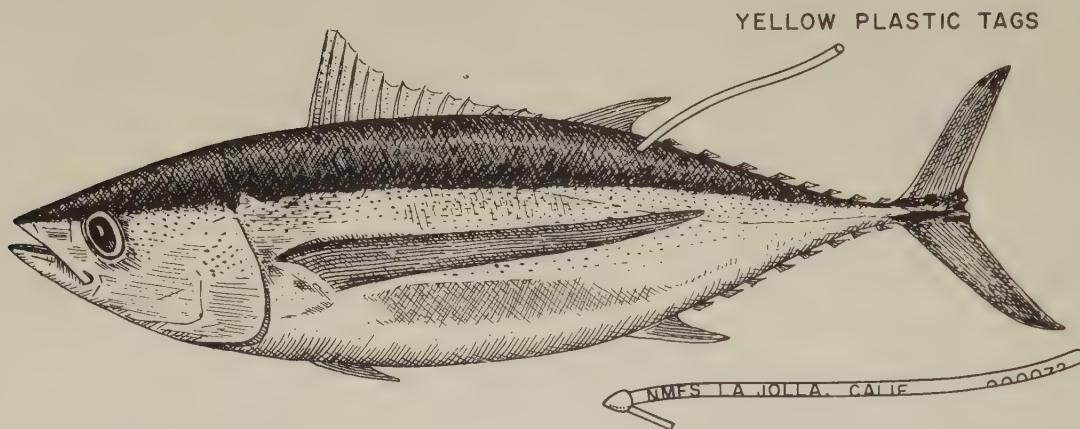
JUNE 1-14, 1973

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714-453-2820



\$ REWARD \$

FOR ALBACORE TUNA TAGS



THE
NATIONAL MARINE FISHERIES SERVICE WILL PAY \$ 2.00 FOR
EACH TAG RETURNED (SOME FISH HAVE MORE THAN ONE TAG).

THE
AMERICAN FISHERMEN'S RESEARCH FOUNDATION WILL AWARD
CASH PRIZES FOR THE NUMBERS DRAWN IN AN ANNUAL LOTTERY.

WRITE:

► WHERE
► WHEN
► HOW
► LENGTH OF FISH (TIP OF LOWER JAW
TO FORK OF TAIL)

} *FISH WAS CAUGHT*

FORWARD TO NMFS ADDRESS ON TAG OR TO AFRF
4904 N. HARBOR DRIVE, SAN DIEGO, CALIFORNIA

Daily broadcasts of albacore fishing information prepared by NOAA's National Marine Fisheries Service will be transmitted over marine radiobands starting July 9 and extending to October 31 or until the season ends. The broadcasts will be made on week-days and Saturday mornings by the following radio stations:

WWD (La Jolla, California) on SSB carrier frequencies 4409.4, 8644.1, 8789.6, and 13147.5 kHz at 0615 and 1745 PDT on weekdays and 0715 on Saturdays.

KFX (Astoria Marine Operator) on 2598 kHz at 0630 and 1945 PDT.

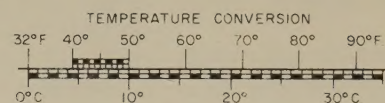
KRED (Eureka, California) on commercial AM 1480 kHz at 0600 and 2000 PDT.

NMC (Point Reyes Coast Guard) on AM compatible frequency 2670 and on SSB carrier frequencies 4383.8, 8732.1, 13147.5 kHz at 0645 and 1945 PDT.

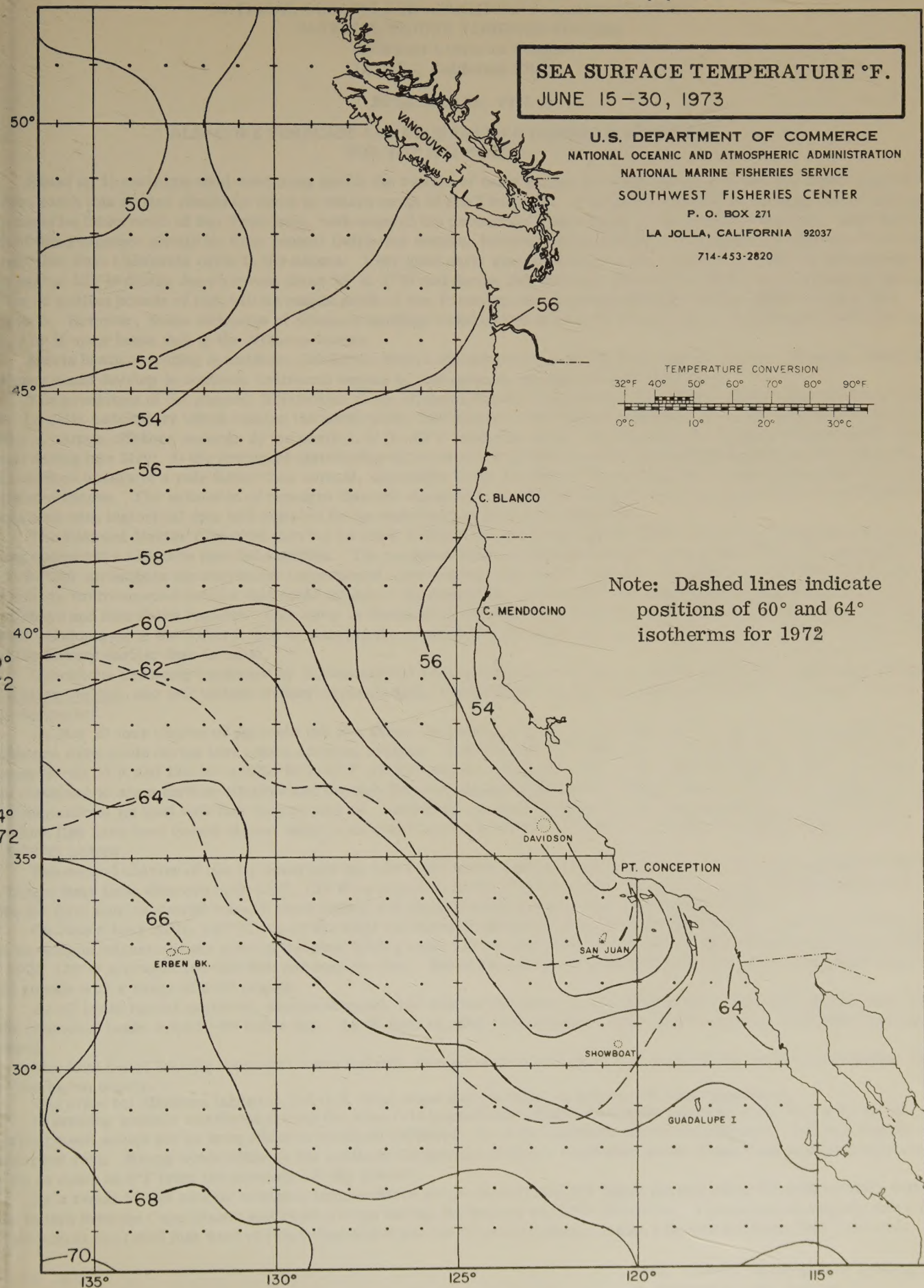
(to determine the upper sideband assigned frequencies for tunable receivers add 1.4 kHz to WWD and NMC carrier frequencies)

SEA SURFACE TEMPERATURE °F. JUNE 15-30, 1973

U.S. DEPARTMENT OF COMMERCE
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NATIONAL MARINE FISHERIES SERVICE
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Note: Dashed lines indicate
positions of 60° and 64°
isotherms for 1972



UNITED STATES DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
Southwest Fisheries Center
La Jolla, California 92037

BULLETIN No. 73-1

ALBACORE FORECAST AND COOPERATIVE RESEARCH ACTIVITIES
FOR THE 1973 SEASON

Based on 1) environmental conditions and 2) the results of early season scouting, it appears that the major portion of the albacore catch this season should be taken in waters north of San Francisco. It is estimated that as much as 75% of the total catch could be taken north of San Francisco, with most of the production from waters in the Pacific Northwest. Best fishing north of San Francisco should be from central California waters, however, good catches are expected off southern California and northern Baja California early in the season. Very good early season fishing is also expected in offshore waters between 145° to 135°W during June between about 33° to 37°N and during July between about 37° to 42°N. It is estimated that approximately 50 million pounds of fish will be caught north of San Francisco and approximately 20 million pounds south of San Francisco. However, these estimates of albacore landings could be low if there is a large influx of additional boats into the area or if many boats fish in the offshore waters.

Sports boats operating in southern California waters should have a good albacore fishing season. However, warm water conditions could develop in southern California waters in late summer and limit fishing success.

The prediction of the general distribution of the albacore fishery is based on 1) an experimental index developed at the NMFS La Jolla Laboratory which relates the north-south distribution of the fishery with oceanographic conditions in the spring months in certain offshore waters; 2) the position of the 60°F isotherm which was as much as 3° latitude further north than normal during late May; 3) the projected distribution of atmospheric pressure distribution which should result in warming of the surface waters at a rate faster than normal, especially in the Pacific Northwest; and 4) the fishing results from scouting offshore waters. The estimates of tonnages that are expected to be landed during the 1973 season are based on statistical calculations with historical data and adjusted for an expected increase in fishing effort.

The National Marine Fisheries Service La Jolla Laboratory and the American Fishermen's Research Foundation are conducting cooperative albacore tuna field studies. The purposes of the cooperative studies scheduled to be conducted during 1973 are to further investigate the shoreward migration of albacore tuna into the North American west coast fishery and the associated marine environmental factors that could influence the migration, and to study the early-season distribution of albacore in offshore and nearshore regions. This study is designed to improve our knowledge of the factors affecting the onset and subsequent development of the fishery, and to examine the possibilities for fishermen to extend the fishery farther offshore and to start the fishery earlier than is usual.

Operations are being conducted by 12 commercial fishing vessels on charter to AFRF and by the NMFS research vessel R/V Starr Jordan, and will include fishery-oceanography, conventional tagging, and tracking of albacore by the use of ultrasonic equipment.

On May 10 four chartered jig boats left San Diego and headed directly to the area near Erben Bank where good catches of albacore were made during last year's scouting cruises. The first catch by this year's chartered vessels was on May 17 between 33°-33°30'N and 134°30'-136°30'W in 63°F (17.2°C) water. Although catches were made in this vicinity, the chartered boats continued to scout further offshore and through the area around 34°N, 139°W where a tugboat caught two albacore on May 12. A commercial jig boat took four fish on May 15. However, albacore were not caught again until May 21 near 33°30'N, 144°W. Since then fish have been caught almost daily in an area bounded by 32°N to 35°30'N and 146°30'W to 134°30'W in 61°-68°F (15-20°C) waters.

The second charter of two jig boats and two bait boats which departed San Diego on May 25 also headed toward Erben Bank and caught their first albacore near 32°N, 136°W on June 2 in 64°F (17.8°C) water. By June 5 the two jig boats entered the area where the first four chartered vessels were fishing and the bait boats were on their way to this vicinity.

On June 5 near 33°N, 142°W, two of the eight chartered boats had scores of better than 200 fish, and most of the albacore not working in offshore areas entered the good fishing zone. From June 6-9 and on June 11 all boats fishing between 33°N, 144°W to 33°N, 139°W averaged 100-200 fish per boat per day. Water temperatures were 66-68°F (18.9-20°C), and albacore averaged 12 pounds with a range of 6-38 pounds.

As all boats moved eastward, scores dropped, but catches continued on mixed-size fish. The high catches from June 12-14 on the chartered boats were 40-80 fish a day. As of June 14, 8285 albacore have been caught, of which 1246 have been tagged and released.

The final set of four jig boats will leave Astoria, Oregon on or about June 16 to work off the northern California, Oregon and Washington coasts.

The price for albacore landed on the U. S. west coast has not been set and is still being negotiated.

Prevailing weather conditions during the June 1-14 period have retarded seasonal warming along the entire North American coast except for an area offshore southern California and Baja California where temperatures rose at a slightly faster than normal rate. Strong winds offshore the southern Oregon and northern California coasts caused sea surface temperatures to drop by as much as 6°F from the previous 15-day period.

As a result of this cooling process, temperatures are between 2° and 4°F below normal along the entire coast, with offshore waters between Cape Blanco and Point Arenas having the largest negative anomalies. Temperatures slightly above normal for this period are found just west of Point Conception and the Channel Islands and also offshore northern Baja California.

